

CONFIDENTIAL

27 March 1975

FY 76 OPERATIONAL PLAN

1. Packaged Power Survey [] Q-open

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Resources to be used for procurement of hardware items of interest to permit continuing monitoring of new products at [] Actions will be scattered during FY; project officers will be subject to each action.

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2. Power Sources Testing [] Q-1st

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This action provides the basic support for the [] Engineering Test facility. New funds will be needed in October, therefore contract action should be initiated in August. Until staffing develops, [] will be PE. Believe that [] should be named as back-up and the usual action officer.

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3. Personal Services [] Q-open

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Funds should be aggressively used to obtain technical expertise to supplement the developing staff. Two actions are presently identified. Firstly, [] should be tasked at about the 5K level to provide support on phases of battery testing, particularly the test-set and accelerated techniques. Secondly, [] should be tasked to analyze thoroughly the []

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characteristics and capabilities available from beta-voltaic cells with tritium vs, plutonium 238 powered, RTG's. Other tasks will be established.

4. DC-DC Converter [] Q-1st

This planned FY 75 Task should be pushed. []

[] proposal and contract packages is ready for action. Prime objective should be to gain freedom from electrochemical system, voltage parameters when selecting a power source for a given application. [] APB, will be PE. (Even if launched in late FY 75, these funds should also be invested to regain lost time.)

5. 30 AH Stretched D [] Q-3rd

This lithium/V₂O₅ item deserves attention since it offer/s the highest practical energy density yet identified with a good power and temperature capability. Assuming favorable results on the [] FY 75 projects to attain this energy density while controlling corrosion problems, an objective development should be undertaken in the third quarter. [] is PE.

6. Power Sources Manual [] Q-2nd

The plan is to produce a Users' Manual which will describe and characterize batteries used by the Agency. In-house products, commercial items and, as available foreign products will be included. Testing, pack-construction and handling directions will be described.

[] is a possible contractor. [] should be considered a PE (or perhaps, [] ; this badly needed product will provide an excellent training opportunity for new talent.

7. Solar Array Fabrication Manual [] Q-2nd

This Agency now has a significant investment in the terrestrial use of solar arrays. ~~the~~ Technology from OTS, ORD and OEL should be fully documented in an Array Fabrication Manual in order to preserve developed technology. (Adequate reports and data exist for design studies and parametric assessments of applicability.)

Possibilities for doing this task are through ORD [] as PE) or possibly in-house by a consultant. Not to be overlooked is a long-shot possibility of a tour by an OSI-analyst for the accomplishment of the task. Dollar estimate may be high. Suggest that [] handle this one.

8. Lithium/Thionyl Chloride Cells [] Q-3rd

Projecting, this system appears to present the best general use capability for lithium battery technology.

The present program at [] and varied other government and industry supported actions should provide a solid base by January 1976 to launch a highly objective engineering development program. Unless done, OTS will continue to "make-do" with incompletely developed hardware which is not design^{ed} for unique applications. This is a priority project; [] should handle.

*In-house
Electro-Optics*

Competitive

*Remove thionyl
limitation.*

9. Lithium Products Evaluation

Q-2nd

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The same chemistry that makes these systems of such interest is also the basis for concern. Safety problems have arisen nationally. Care must be exercised in the use and handling of cells. Special techniques (including those of disposition) must be developed, clearly documented and distributed to users. [redacted] should handle.

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10. Accelerated Life-Testing

Q-1st

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The present [redacted] research contract has demonstrated an interesting constant potential testing technique for at least some lithium cells. The promise of perhaps a 100 to one reduction in test time for lot acceptance tests, stock surveillance and R&D testing warrants continuing support. Perhaps [redacted] as PE with [redacted] as consultant, as noted.

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11. Battery Field Test-Set

Q-1st

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An old, but critically important need where supply lines are as long and tenuous as the Agency's. Because new electronic and computer technology gives new freedoms, effort should be directed at the development of a multi-position test-set capable of evaluating the capacity and freedom from defects in cells and batteries. Variations to accept different cell types will be necessary. This complex problem should be approached by examining a cell both as a chemical system and as a structure. Parameters

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to test and means for testing will thereby be identified. Suggest [] for this one, again with [] supporting.

12. Lithium Technology Transfer [] Q-2nd

This project is necessitated by the phaseout of [] from the lithium cell business. It is necessary to insure continuing availability of hardware already in operational use. First action before July is to establish stock needs and insure that action is taken to obtain delivery from [] during calendar 1975. The second action is indeterminate ^{at} of the moment pending [] disposition of their interests to licensees. [] on this one.

13. Formable Cells [] Q-1st

ORD is managing the completion of a well-coordinated effort with [] for the exploratory phase of this development. Action should be taken for OTS to pick-up this project with a product engineering project in August or September. [] has all the background and should continue on this one.

14. Ambient Energy Power [] Q-2nd or 3rd

This project needs analysis and planning. First steps are to explore the subject with AEB and to determine what ORD's program is in response to OTS requirements. Groups other than OTS are interested in this work - keep the base, ~~board~~ broad. Consider RF and inductive fields.

15. Thinline Battery Pack

[redacted] Q-1st

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Competitive

Reexamine the plan prepared early this year in which dual approaches were to be explored. This need is specific now; get an objective specification reflecting both the using system and the environment, then select a course of action. The present plan is too reflective of cell attributes, not the need.

[redacted] as PE.

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16. Selected Lithium/Sulfur Dioxide Cells

[redacted] Q-2nd

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Competitive

These cells are currently in use for video packs and as hermetically sealed hardware becomes available one can expect broadened applications throughout the Agency. Several companies are highly competitive therefore our role should be to evaluate and select the best capability (on competitive basis) for the desired cell sizes. [redacted] as PE.

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17. Advanced Flat Cells

[redacted] Q-2nd

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The electrochemical research program at [redacted] identified a new depolarizer, mercuric arsenate, which needs to be examined in hardware. The flat cell is selected due to increasing interests and the characteristics of the depolarizer. Flat discharge, $2.1v \pm 0.2v$, at 15 watt hours/cubic inch and at good power levels over a wide temperature range, argue strongly for both audio and beacon use. To inject new thinking into the technology involved, [redacted] is suggested as PE.

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18. RTG Basic Unit

[] Q-1st & 2nd

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An initial effort will be [] to extend present life test project and to increase emphasis on diagnostics. In view of the shrinking contractor base, an assessment must be made prior to acting on a structural analysis and redesign.

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Contacts in government (IAPG and ERDA) will be made to determine national response to this need. Recommend that [] be PE, at least until a course of action is set.

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19. Sensor, Power Package

[] Q-2nd

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To discharge broadened Agency-wide responsibilities, it is necessary to provide support to [] (OEL, OD&E/EG and ORD). New metal/air and metal/hydrogen cells warrant assessment as a starter. [] is an appropriate assignee as PE.

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20. Hybrid Support Systems

[] Q-3rd

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The whole subject of hybrid power sources in its many forms has not been tapped. Ranging from ambient energy/secondary battery systems to others substituting RTG's for the ambient energy and on to storage cells for standby energy plus charging a pulse power cell, this topic needs analysis and programming. For this reason it is 3rd Q. [] is recommended as PE with [] deeply involved.

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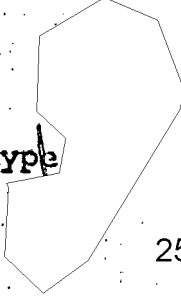
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21. Hardware Support Capability Several Actions

Various These resources are to carry the packaging and related support efforts required to be responsive to the various systems developers when requesting prototype and even limited operational, power packs.  should handled this one.

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22. Mercuric Oxide/Zinc Cells

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Technological advances since OTS last actively supported this field are extensive. It is time to examine moving ahead to gain a new generation of capability. (Unbudgeted 'til FY 77)

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23. Mercad Extended Life Cells

The extreme stability of this chemical system warrants exploitation of a secondary capability for ambient energy, hybrid systems. (Unbudgeted 'til FY 77)

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24. Tritium Power Source

Open Possibilities should be exhaustively explored in lieu of RTG's for general operational use. (Unbudgeted 'til FY 77)